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The Neurological Examination

T. M. SIENIEWICZ, M.D.

This paper will deal with

- (1) a scheme or a pattern giving a general outline of the method of examination to be carried out, and
- (2) a more detailed account of the methods employed in carrying out the examination.

It will be necessary to make some brief references to the anatomy and physiology of the nervous system, but apologies are offered because one is not able to go more fully into the matter of correlative neuroanatomy at this time.

History:

Complaints: List the main symptoms and if possible in the sequence of their appearance—also in patient's own words.

Past History: Note all illnesses from infancy onwards.

Present Illness: Put all these events in chronological form. Begin the description of each symptom with the time of appearance—so many years or months or weeks ago.

Family History: Whether relevant or not.

Habits: Re smoking, drinking, etc.

Functional Inquiry: This is most important. Routinely cover every system. Make sure about headaches, pain, fits, disturbances of consciousness, vision, hearing, tinnitus, micturition, bowel function and sexual power. What has he to say about his powers of concentration?

The clinical history will in all probability make the "etiological" diagnosis. It should decide whether the lesion is inflammatory, neoplastic or a vascular accident such as a haemorrhage, embolus or thrombosis.

The physical examination should bring out all the signs by which you should be able to make a "focal" diagnosis.

Physical Examination:

Note signs in general.

Note mental state. Is the patient alert, slow, confused or stuporous?

Note emotional state. Is he depressed or exalted, or unstable and prone to laughter or tears.

Note the memory for recent or past events.

Note speech defects of comprehension or expression (words, writing or gesture.)

Cranial Nerves: You should now go over all the cranial nerves.

1. Anosmia.

2. Visual acuity R. and L.

Visual fields on (a) confrontation.

(b) perimetry, if necessary.

Fundi—oedema, haemorrhage, exudate, atrophy. Take a liberal view of normality.)

3, 4 and 6.

Pupils: Are they equal, central and circular?

Reaction to light and accommodation.

Convergence (and accommodation).

Range of E.O.M. (external ocular movements).

Note nystagmus, diplopia, strabismus, ptosis, exophthalmos and enophthalmos.

5. Corneal reflexes.

Sensory loss on face and anterior half of scalp (to pin-prick and cotton wool).

Masseters and temporal muscles on mastication.

Does jaw open in midline?

7. Note symmetry of face at rest, on voluntary and involuntary movement. Produce a smile.

8. Hearing tests, Weber and Rinne tests.

9 and 10. Note if palate rises in midline on phonation; pharyngeal gag reflex; nasal quality to voice; if able to swallow without regurgitation through the nose.

11. Test sternomastoids and trapezius muscles.

12. See if tongue protrudes in midline. Note tremor, atrophy, fibrillation, wrinkling. Test strength of tongue against the cheek.

Motor System:

Upper limbs—is position of outstretched hands well maintained?

Is tone normal?

Is muscle power good and equal both sides?

Is co-ordination good (muscle synergy).

Note atrophy, tremor, or fibrillation.

Abdomen—Can patient sit up in bed without assistance.

Note umbilical deviation (ask patient to raise his head against resistance).

Lower limbs—Note posture at rest; tone; power and equality in muscle groups; co-ordination; also atrophy, tremor or fibrillation.

Reflexes:

	R.	L.
T.J..... (Triceps).....	+	+
B.J..... (Biceps).....	+	+
S.J..... (Supinator).....	+	+
Upper.....	+	+
Lower.....	+	+

Abdominal:

K.J.....	+	+
A.J.....	+	+
Plantar.....	Flexor	Flexor

Sensory System:

What are the reactions to: cotton wool, pressure, pin-prick, heat and cold, and vibration?

Note: Position sense of limbs, fingers and toes on passive movements.

Two-point discrimination.

Localization of touch.

Discrimination of touch with different materials.

Stereognosis (recognition of objects placed in the hands).

Gait and stance:

Rombergism—observe this when doing finger-to-nose tests.

Then finish up by doing examination of cardio-vascular system, respiratory, abdominal, skin, bones and joints, ear, nose and throat.

Finally do (1) Lumbar puncture.

(2) Radiological examination.

Examination of Cranial Nerves

I C.N. Olfactory nerve. Fibers pass from ethmoid mucosa to olfactory cortex. Fibers are crossed and uncrossed.

Anosmia—Test each nostril separately by using familiar volatile oils: nasal defects affect sense of smell.

II C.N. Optic nerve. Fibers pass from the rods and cones of the retina to the occipital cortex. Fibers are crossed and uncrossed.

(a) Visual Acuity—R. L.

Use Snellen Card, or finger counting or movement, or light perception.

(b) Fields of Vision—(1) Rough test by method of "confrontation". Patient covers one eye and focuses with the other upon the opposite eye of the examiner who sits opposite about a yard away. Then use a large white-headed pin or a piece of white paper $\frac{1}{4}$ " square fixed between points of a pen-nib on a pen-holder. The test object is brought in midway between the observer and the patient, from the periphery to the centre of field of vision from all points. In this way the outer limits of the field of vision can be roughly determined.

(2) Perimetry should be used for accurate plotting of the fields of vision.

Presence of scotomata may be detected at this time.

Visual field defects may be found such as blindness in one eye, bitemporal hemianopia or hemianopsia, unilateral hemianopsia, homonymous hemianopsia, with or without loss of pupillary light reflex; or quadrantanopsia.

(c) Color blindness tests.

(d) Ophthalmoscopic examination of the fundus oculi. Pay attention to type of retinitis, optic atrophy, papilloedema or choked disc; to the state of the retinal vessels.

Mention disseminated sclerosis, increased intracranial pressure, tabes, nephritis and diabetes in relation to such examination.

III, IV and VI Cranial Nerves:

III C.N. Oculomotor nerve. Arises from a nucleus in the mid-brain. Fibers are *mainly uncrossed*. Para-sympathetic fibers are conveyed to the constrictor muscle of the iris and to the ciliary muscle. The oculomotor nerve supplies all the eye muscles except the superior oblique and the external rectus; it supplies the levator palpebrae, superior, internal and inferior rectus muscles and the inferior oblique muscle.

IV C.N. Trochlear nerve. Fibers entirely crossed. Nucleus is in mid-brain. It supplies the superior oblique muscle which moves the eye down and out.

VI C.N. Abduceus nerve. Fibers entirely uncrossed. Nucleus is in the pons. Enters the orbit with III and IV to supply the external rectus.

Tests: 1. External ocular movements:

Finger following is a good method. Are these normal in range in all directions and is deviation well sustained (nystagmus)? Avoid extreme deviation (normal nystagmoid jerks). Is there a squint, and diplopia? Is there unilateral or bilateral ptosis, exophthalmos or enophthalmos? Although the internal recti are normal, is there paralysis of convergence and loss of accommodation? Is the frontalis muscle used to raise the eyelids?

2. Pupils: Are they equal, central and circular? Do they react to direct and consensual light and to accommodation?

Mention the Argyll-Robertson pupil—contracted pupil, loss of light reflex, no loss of accommodation.

3. Palpebrae: Cervical sympathetic syndrome (Horner) consists of:

(1) ptosis of mild degree.

(2) miosis with no dilatation from cocaine instillation.

(3) enophthalmos from paralysis of M. orbitalis and thereby allowing lower lid to rise a little.

(4) vasodilatation of skin of head and neck, and

(5) loss of sweating in this area (pilocarpine).

In myasthenia gravis the ptosis appears on fatigue.

Exophthalmosis: bilateral in thyrotoxicosis; unilateral in orbital neoplasm or an arteriovenous aneurism.

V C.N. Trigeminal (motor and sensory). Motor part arises in the pons and supplies all muscles of mastication. Sensory arises from Gasserian ganglion and supplies sensation through the ophthalmic, maxillary and mandibular divisions.

Tests: Motor—Do the masseter and temporal muscles harden and swell when the teeth are clenched? Palpate.

Does the jaw open in the midline against resistance?

Watch relative position of teeth, or mark a midline on upper and lower lips.

Deviation of jaw takes place to the side of the lesion (pterygoid muscles).

Sensory—Test corneal reflex by blowing onto the open eye or by touching the cornea with a wisp of cotton wool.

Test sensibility of the skin of the face and anterior half of the scalp to *touch* with cotton wool, to *pain* with pin-pricks, and to temperature with hot and cold test-tubes.

Points of exit of the chief sensory nerves should be tested for tenderness.

VII C.N. Facial nerve, and principally motor. The fibers arise from a nucleus in the pons and supply the muscles of the face, lips, eyelids, forehead and anterior part of the scalp.

The sensory fibers arise from the anterior two-thirds of tongue and transmit impulses of taste. Secretory and vasodilator fibers (parasympathetic) pass to the sublingual and submaxillary glands.

Tests: Upper facial—Is the face symmetrical at rest and on movement? Ask the patient to raise his eyebrows, to frown, and shut his eyes by screwing them up tight (Bell's phenomenon).

Lower facial—Ask patient to show his teeth, blow out his cheeks, to whistle and smile. Observe the platysma muscles when angles of the mouth are drawn down. Ask patient if he can tell a funny story and watch the emotional expression (lesion in thalamus). Mention "contracture" of long standing facial palsy. Examination of taste should always be carried out in a case of facial palsy. There is loss of taste with involvement of the chorda tympani nerve.

If the lesion is in the pons, then the VI C.N. is as a rule involved as well.

VIII C.N. Acoustic or auditory nerve. Entirely sensory, and consists of the cochlear and vestibular nerves. The nuclei are in the medulla oblongata.

Tests: (1) Cochlear nerve. Apply hearing tests with a watch and a whisper. Is there any tinnitus? Examine for nerve deafness with a tuning fork. Describe method (Weber test).

Rinne's test is carried out with tuning fork placed on the mastoid. Describe method of comparing bone conduction with that of air conduction. Air conduction is normally stronger and longer than bone conduction.

(2) Vestibular nerve. Is there any vertigo? Is there nystagmus? Tests consist of Rotation Test, past-pointing, and ear irrigation with warm and cold water (caloric).

Mention sea-sickness, Meniere's syndrome.

IX C.N. Glossopharyngeal nerve. Contains motor, sensory, secretory and vasodilator fibers. Nucleus is in the medulla.

Motor—fibers to the stylopharyngeus muscle.

Sensory—supplies general sensation to pharynx, soft palate posterior third of tongue, fauces, tonsils and Eustachian tubes. To carotid body and sinus (heart rate and B.P.).

To taste buds in posterior third of tongue.

Compression, inflammation and trauma generally involves the IX, X and XI C.N.

Tests: Pharyngeal gag reflex.
Constriction of the posterior pharyngeal wall when saying "Ah."
Taste tests on posterior third of tongue.
Pressure on carotid sinus produces slowing of heart and fall in B.P.

X C.N. Vagus nerve (a mixed nerve). Nucleus in the medulla.

Motor—(a) *voluntary* to intrinsic muscles of larynx; (b) *autonomic* to muscles of bronchi, heart, oesophagus, stomach, gall-bladder, pancreas, small bowel, and first third of large bowel.

Secretory—to gastric glands and pancreas.

Sensory fibers establish a reflex center with the motor autonomic. Intramedullary and basilar lesions often involve IX, XI and XII C.N. as well.

Tests: Is there a nasal quality to voice? Do fluids regurgitate through the nose? What about ability to swallow fluids and solids? Phonation? Does the palate rise normally in midline during respiration and phonation?

Do laryngoscopic examination.

Test sensory status of pharynx and larynx, pharyngeal reflex.

XI C.N. The accessory nerve (motor). Consists of a cranial and a spinal part.

The cranial fibers arise from a nucleus in the medulla.

The spinal arise from the anterior horn cells of the upper five cervical segments of the spinal cord. Most of the muscles of the pharynx, larynx and soft palate are supplied by the cranial part. The spinal part supplies sternomastoid and trapezius.

Tests: Have the patient attempt to turn his head against the resistance of the examiner's hand placed on the patient's chin. The upper portion of the trapezius is tested by having the patient shrug his shoulders against resistance.

XII C.N. Hypoglossal nerve (motor).

The nucleus is in the medulla, and the fibers supply the muscles of the tongue.

Tests: Ask the patient to put out his tongue. Is there any deviation to one side? Is there atrophy or fibrillation? Note if there are any wrinkles on the tongue. Strength of the tongue is tested by having the patient push the tip of his tongue against the cheek and against the resistance of the examiner's finger.

Lesions of the bulb (medulla oblongata) produce characteristic symptoms as the result of involvement of the motor and sensory pathways passing through the bulb and particularly involvement of the nuclei of the last four cranial nerves which lie within it. We, therefore, have a number of well-known syndromes made up of various combinations.

Lesions in the form of injuries involving the jugular foramen or the retroparotid space, produce characteristic syndromes as the result of peripheral lesions of the last four cranial nerves,

The Motor System

Briefly we shall review the organization of this system under four headings:

- (1) the upper motor neurone—pyramidal,
- (2) the extrapyramidal,
- (3) the cerebellar, and
- (4) the lower motor neurone.

The upper motor neurone: These fibers arise from cells in the cerebral cortex, then pass through the internal capsule, the brainstem, the medulla at the lower end of which they decussate, then pass through the lateral tract of the spinal cord as the pyramidal tract, to end in the motor cells of the anterior horns.

This system carries out all voluntary movements, and a disorder of function of this leads to a true paralysis of movements.

The *extrapyramidal* system of motor neurones consists of the corpus striatum, the substantia nigra, the red nucleus, the vestibular nucleus, etc. The fibers from these descend through the cord via the rubrospinal tracts, the vestibulospinal and the reticulospinal tracts, and end in the anterior horn cells.

This system controls posture, muscle tone and co-ordination.

The *cerebellar* system comprises tracts coming from the cerebral cortex, the spinal cord, and from vestibular nucleus and labyrinth; and tracts going to lower motor neurone via the red nucleus. Its function is to bring about harmonious and co-ordinated action between muscle groups (muscle synergy).

The *lower motor neurone* is the "Final Common Pathway." Its cell is either in the anterior horn of the cord or in one of the cranial nuclei. The axons form the peripheral motor nerve (cranial or spinal).

A few remarks are now necessary about muscle tone, tendon reflexes, and cutaneous reflexes.

Muscle tone: During consciousness the voluntary muscles are at all times in a state of slight contraction which is referred to as *tone*—best seen in "anti-gravity muscles." This "tonus" is entirely reflex in character. The muscles are constantly stretched between their attachments, and this stretch stimulus applied to muscle spindles initiates the reflex. A lesion in this arc produces a loss of tone in the muscle involved. Palpation of the belly of a muscle gives no reliable indication as to state of "tone." You will assess by passive stretching of muscles. We get "hypertonus" or "spasticity" in upper motor neurone (pyramidal) lesion, and of a different type, described as "rigidity," in extrapyramidal lesion, e.g., in paralysis agitans. Hypotonus or flaccidity obtains in lower motor neurone lesion.

The tendon reflexes. This is a further example of the stretch reflex. When muscle tone is increased above normal, then the response to the tendon tap is increased. We get an increased "jerk." Sometimes the response is a series of jerks, which is called a "clonus" (ankle and patellar). An interruption in the reflex arc will abolish the "tendon jerk." Thus, in the case of a local spinal cord lesion such as an injury or a tumor or syringomyelia, the reflex may be abolished in one segment. (Refer to segmental localization of tendon jerks.) Normally there is a uniform degree of briskness of all tendon jerks, but occasionally one finds a normal in whom these reflexes are absent. (Areflexia).

Cutaneous reflexes. Stroking or scratching of the skin in certain regions will cause a brisk contraction of underlying muscles. Thus the abdominal and plantar responses are of great clinical importance.

Let us now consider the signs and symptoms of a disorder of the motor system at each level.

Lesion of the upper motor neurone—we find

- (1) loss of voluntary movements,
- (2) increase of muscle tone—spasticity,
- (3) increase of tendon jerks and clonus,
- (4) loss of cutaneous reflexes,
- (5) plantar extensor response.

The plantar extensor response is of great importance. Here the normal plantar flexion is abolished and is replaced by plantar extension. Use the lateral half of the sole of the foot for testing.

Hemiplegia—(a) Of acute onset. There is usually unconsciousness; entire musculature is *flaccid*. There is conjugate deviation of eyes toward the paralyzed side, along with flapping of the cheek. The abdominal reflexes are lost on this side, and plantar response is extensor.

(b) Spastic type (residual). When shock phase passes off, then the release signs appear. Spasticity gradually develops; the arm adopts attitude of flexion and adduction; leg straight with plantar flexion. The tendon reflexes become increased. Recovery of movement takes place with the upper limb last and least.

Haemorrhage in region of internal capsule is commonest cause of hemiplegia, and if extensive then the nearby sensory and optic radiations may be involved, thereby producing hemianaesthesia and homonymous hemianopsia.

Paraplegia—There are two forms.

(a) Paraplegia-in-extension. This occurs in lesions of gradual onset (disseminated sclerosis). There will be weakness of the movement of dorsiflexion, so that the foot will trip on uneven ground; then flexion of the leg weakens so that the leg is shuffled in walking. Tendon jerks increase and spasticity appears in the extensor muscles. Plantar extensor response appears very early. Finally the legs become rigidly extended and adducted. If other pathways become involved, then we get

(b) Paraplegia-in-flexion. Here involuntary flexor spasm makes its appearance so that finally the legs become fully flexed with the knees against the abdominal wall. The plantar extensor response becomes so marked and so easily elicited that even a pinching of the skin above the knee will produce it. Sensory loss and loss of sphincter control are usually present (final stages of D.S. and unrelieved compression of the cord).

Sudden transection of the cord produces a "spinal shock" with total flaccid paralysis, total sensory loss, loss of tendon jerks and plantar response, and retention of urine. If patient survives, then the signs of paraplegia-in-flexion may develop.

Combined lesions of dorsal and lateral columns—To the weakness from lateral column lesion we get loss of postural sensibility. Tendon jerks and hypertonus are lost but plantar extensor remains. Seen in Friedreich's Ataxy and subacute combined degeneration.

Symptomatology of lesion of extrapyramidal system. The lesion is almost always chronic and of gradual onset. There is no true paralysis, but release symptoms predominate and may exhaust the muscles. We get (1) disorder of muscle tone and (2) involuntary movements. There are three main symptom-complexes:

- (1) tremor—rigidity of paralysis agitans, (Parkinsonism),
- (2) athetosis,
- (3) choreiform syndrome.

Tremor-rigidity—The hypertonus of the extrapyramidal system is different from the pyramidal. It is best described as a "lead-pipe" rigidity—it is like bending a soft lead pipe. There is a tremor present as well (cog-wheel rigidity). The entire skeletal muscle system except the external ocular muscles becomes involved. In walking the arms stop swinging. Tremor may cease at rest and always in sleep. Tendon jerks, abdominal reflexes and plantar responses remain normal.

Athetosis—This consists of slow, writhing movements of limbs and hands, and increased by attempts at voluntary movements. Eye movements escape. They cease in sleep. The lesion is in the corpus striatum.

Choreiform syndrome—This is characterized by jerky, inco-ordinate movements of the limbs, trunk and facial muscles. They occur in rheumatic chorea and in Huntington's chorea. Lesions are found in the basal ganglia.

The symptomatology of cerebellar lesions, characterized by ataxy or failure in the harmonious co-ordinated action between muscle groups. It may be nystagmus or intention tremor. The signs are confined to the same side as the lesion. Reflexes remain normal and there is no sensory loss.

- (1) Eye movements—We get a nystagmus, horizontal type. It is really an intention tremor of the eye muscles.
- (2) Articulation. The speech is of a "scanning" or staccato type. It may even be unintelligible.
- (3) Movements of hands and feet. There is inability to estimate range of voluntary movements. There is past-pointing in the finger-to-nose test with coarse, jerky movements.
- (4) Then there is inability to perform rapidly alternate movements such as supination and pronation (adiadokokinesia).
- (5) Rebound phenomenon of Holmes—This is a lack of check reflex. Test by asking the patient to flex his arm against the resistance of the examiner, and then suddenly release the arm. The arm will strike the patient's face or body.
- (6) Spontaneous deviation—The patient holds both arms outstretched and then closes his eyes. The homolateral arm may swing away from the symmetrical position.
- (7) Movements of the legs—The same disorders appear as in hands and arms. Therefore, these are made manifest in the gait and stance of the patient. The ataxia consists of a reeling, drunken, unsteady gait with a tendency to fall toward side of lesion. The ataxia is increased by closing the eyes (positive Romberg).
- (8) Hypotonia—marked flaccidity of muscles is seen in acute cerebellar lesions.

The Symptomatology of Lesions of the Lower Motor Neurone: When the motor nerve supply to a muscle is cut off then the muscle becomes completely paralyzed and flaccid; the tendon reflex is abolished, and the muscle wastes away. The muscle will be tender to pressure and subject to cramps. Then with fibrosis this muscle shortens and we get a contracture. In a slowly progressive lesion one may get twitchings or fibrillations.

The Sensory System:

There are two components, sensory and non-sensory.

The sensory impulses travelling in the sensory pathways enter consciousness, while the non-sensory do not as they are involved in the maintenance and regulations of muscle tone and posture.

Sensory—From periphery to the brain. The sensory fiber begins from the end-organs of skin and ascends via the peripheral nerve and the dorsal root to enter the dorsal column of the cord. All modes of sensibility are conveyed. A re-arrangement now takes place. The impulses of tactile, postural and vibration sensibility travel upwards in the dorsal column in the primary neurone on the same side as they enter (uncrossed sensory path); on reaching the lower end of the medulla, the primary neurone synapses with the cell of the secondary neurone and then immediately decussates. This secondary neurone travels through the pons and midbrain and ends in the thalamus. Here the third neurone arises and travels to the sensory cortex to consciousness.

The impulses of pain and temperature are conducted by the primary neurone to the posterior horn, where the secondary neurone begins. This crosses the cord and passes by the central canal closely (important in syringomyelia) to reach the lateral column to turn upwards as the *Crossed Sensory Path* (lateral spino-thalamic tract). This neurone ends in the thalamus.

The impulses of tactile sensation not only travel by the uncrossed sensory path, but also have a crossed pathway of their own (anterior spino-thalamic tract). (See diagram, Walshe p. 32) You will note therefore that all sensory pathways enter the thalamus (lateral part) where a final re-arrangement takes place. Now some of the fibres carrying impulses go to another part of the thalamus (pain and temperature) and others (touch and postural) go to the sensory area of the cortex.

We must refer to other modes of sensibility which, however, are based on touch and postural sensibility. These are

- (a) "two-point" discrimination.
- (b) discrimination of touch with different materials and
- (c) localization of sensation.

These sensory functions are performed in the sensory cerebral cortex.

The Non-Sensory System:

These impulses arise in muscles, joints, bones and in the labyrinth. They travel by spinocerebellar tracts to the red nucleus and the cerebellum. The cerebral motor cortex uses this system to get harmonious co-ordination of motor action.

Symptomatology of lesions of the sensory system:

- (a) Lesions of the peripheral pathway affect all modes of sensibility.

- (b) Lesions of the spinal cord may affect some modes and leave others intact (spinal re-arrangement).
- (c) Lesions of the thalamus may affect all modes but not always equally and
- (d) Lesions of the sensory cortex involve only the spatial and discriminating modes of sensibility.

May get pain, abnormal sensations (paraesthesiae), impairment or loss of sensation.

Paraesthesia, or tingling and numbness, or "pins and needles" may result from a lesion in any part of the sensory pathway.

Sensory Ataxy: is the result of defect of postural sensibility. Position of a limb and range and direction of movement are unknown to the patient (with eyes closed).

Astereognosis: the patient is unable to identify objects held in his hand. Finger-to-nose test will show error of projection and patient will miss the objective. In cerebellar ataxy there is no error of projection, but there is a marked intention tremor in reaching the objective.

Postural sensory loss is much more disabling than cutaneous sensory loss.

In lesions of peripheral sensory neurone the findings correspond to the distribution of the peripheral nerve. May have anaesthesia surrounded by a partial loss.

In lesions of spinal sensory pathways the findings depend upon part of cord involved. A lesion in the dorsal column will cause a loss of the sense of position and vibration, while a syringo-myelia will interrupt the pain and temperature fibers alone.

A lesion involving the entire half of the spinal cord above the 12th thoracic segment will produce the Brown-Sequard syndrome (see diagram p. 39, Walshe). There will be loss of postural and vibratory sensibility on the side of lesion, loss of pain and temperature on the other side, along with signs of pyramidal tract lesion on same side (spasticity, increased reflexes, clonus, and plantar extensor response).

In lesions of sensory pathway in the brain, a local lesion will produce a crossed hemianaesthesia in which all forms of sensation are affected.

Thalamic syndrome consists of ataxy, sensory loss and intractable pain (also relatively slight and transient hemiplegia).

Lesion in sensory cerebral cortex is characterized by loss of two-point discrimination, loss of the sense of localization of touch, loss of the sense of discrimination in respect to *size, shape and texture of objects*.

The Sphincters:

In cerebral lesions: at the moment of apoplexy both bladder and rectum may be involuntarily evacuated. Instead there may be retention of urine with an overflow incontinence.

In spinal cord lesions: in acute transverse lesions with total paraplegia there is retention, with overflow, then periodic emptying of the bladder—but there is always some residual urine. In slow progressive spinal cord compression we get urgency of micturition and finally automatic micturition. (D.S.) Fecal incontinence, periodic, occurs in total paraplegia.

The Speech Function:

Speaking and writing—two functions (a) referential and (b) emotive. The former is much more severely involved than the latter in disease—although speech is a psychological function yet it has an anatomical and physiological basis. A small local lesion in a certain part of the left hemisphere can produce loss of speech. Hearing and seeing of words are sensory impressions, and speaking and writing are co-ordinated movements. Lesions may affect each separately. The motor cortex and pyramidal tract innervate the path for speaking and writing, producing dysarthria or anarthria.

There are eupraxic centres subserving the sensory and motor sides. So a lesion, whereby a patient cannot comprehend a spoken or written word, produces a *sensory aphasia*. If he cannot make speech movements, he has a *motor aphasia* and if he cannot write words, *agraphia*.

The pituitary—hypothalamus complex:

The pituitary body and its stalk and the hypothalamus may be affected by neoplasm or by compression.

The most important defect symptoms are:—

- (1) Diabetes insipidus (polyuria, polydipsia). Also glycosuria.
- (2) Genital dystrophy—(failure of sexual glands and secondary characteristics to develop). There is impotence and amenorrhoea.
- (3) Disorders of growth—infantilism, gigantism and acromegaly.
- (4) Disorders of sleep and of temperature are hypothalamic affections (somnolence and hyperthermia).

Laboratory Examination

The lumbar puncture and examination of the C.S.F. is carried out as part of the routine examination.

Just as soon as space compensation by the fluid system becomes inadequate, then increase of intracranial pressure takes place.

The average pressure is about 135 mm. of water; the upper limit of normal would be 180. When the needle is in the proper position in the subarachnoid space, then a cough or strain should result in a sharp rise and fall in the manometer.

Queckenstedt Test is now carried out by compressing both jugular veins. Normally there should be a rapid rise of pressure and a rapid fall when the pressure is removed.

Lateral sinus thrombosis can be diagnosed by unilateral jugular compression.

Subarachnoid block from a spinal cord tumor will partially or completely interfere with the rise and fall upon compression of both jugulars.

Removal of fluid—About 10 cc. should be removed for a cell count, protein estimation, Wassermann reaction and colloidal gold curve.

Normal findings: up to 5 lymphocytes per c.m.m., and up to 35 or 40 mgm. of protein per 100 cc. of fluid.

Contraindications to L.P.:

1. Papilloedema due to an expanding lesion is a sign of danger. Inequality of pressure above and below the tentorium cerebelli can be produced by an l.p.

2. Cerebellar lesions with or without a choked disc. Further herniation of the cerebellar tonsils can occur which may prove fatal.

X-ray Examination of the Skull

This should be done in two planes at least.

Note "convolitional thinning" of the skull from increased intracranial pressure.

Note general dilatation of diploic vein channels—result of increased intracranial pressure.

Note pronounced localized vascular channels in skull—meningioma.

Note sella turcica—enlargement due to pituitary tumor.

Note calcifications in the brain of hemangiomas, aneurism or parasitic cysts.

Then special methods may be employed.

- 1 Ventriculography—where warmed air is injected directly into one of the lateral ventricles. This is a surgical procedure.
- 2 Encephalography—(a) large, (b) small. In the former 100 cc. of air are injected by the lumbar route, and in the latter 10 c.c.
By this examination one can study disfiguration and dislocation of the ventricles.
This is nearly always an essential procedure in localizing intracranial new growth.
3. Cerebral angiography or arteriography—This consists of rapid injection of thoro-thrast or diodrast into the common or internal carotid artery and more or less immediate X ray examination for the purpose of investigating suspected vascular anomalies.

Electro-encephalography (E.E.G.)

During an epileptic fit it has been shown that the normal rhythm of action currents produced in the nerve cells of the cerebral cortex, undergoes a characteristic change.

We may get important information therefore, when trying to differentiate epileptic fits from the hysterical type. It is possible sometimes to localize a tumor.

Limitations quoted by Walshe—10 per cent of population will show a graph characteristic of epilepsy, yet no more than 0.5 per cent of population have clinical epilepsy. Therefore "E.E.G. is not as yet a substitute for clinical judgment."

Electrical Examination

Electrical stimulation of muscles and nerves is of value in diagnosis and prognosis. Galvanic and faradic stimulations are used. It is of particular value in peripheral nerve injury from standpoint of prognosis, by making repeated assessments of the RD or reaction of degeneration. Also of value in facial palsy. It is of help in differential diagnosis of upper and lower motor neurone paralysis; of functional from organic paralysis.

An accurate knowledge of the motor points and threshold values is essential in this type of examination.

Pharmacological Tests of the Vegetative Nervous System

The irritability of "tonus" of the sympathetic and parasympathetic systems can be studied by the use of certain drugs. These are adrenaline, acetylcholine, pilocarpine, eserine, atropine and prostigmine. For sites of action of the principal autonomic drugs please refer to detailed literature on the subject.

A further discussion of important neurological signs and syndromes will take place at a later date.

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2. Growers and Tailors—Diseases of the Nervous System (vol 1.) (1899).
3. Larsell—Anatomy of the Nervous System.
4. Monrad-Krohn—Clinical Examination of the Nervous System (7th ed).
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Report of a Committee of the Halifax Medical Society Appointed to Inquire into Repayment Medical Schemes.

Background of Report:

The annual meeting of the Halifax Medical Society was held at the Nova Scotian Hotel on the night of April 25, 1945. The principal speaker was Miss Ruth Wilson of the Blue Cross Hospital Association, who outlined to the Society certain so-called "Blue Shield Plans" for prepayment medical care which were operating in other centres. Following this address there was a considerable expression of interest among members present regarding this type of plan and a motion was passed empowering the President to appoint a Committee to inquire into prepayment medical plans and report to the Society at the next meeting. This present report arises from these circumstances.

This committee has held a number of meetings and has collected a large amount of material on the subject of "Prepayment Medical Plans." They have attempted to digest this information and from it reach some conclusions which they respectfully submit to the membership of the Society.

History of Prepayment Medical Plans:

Historically,* prepayment medical plans were first developed by employees of certain dangerous industries chiefly lumbering, mining and railroading, and generally in areas remote from other medical facilities. At the beginning they were often closely linked with Workmen's Compensation Laws and such laws affected their development. Such laws were first passed in the State of Washington, United States, in 1911, requiring employers to compensate the worker for the loss of earnings but did not require that he provide medical care. In 1917 the same state passed a medical aid act which provided that employer and employee would contribute equal amounts to defray the costs of medical care for industrial accidents and injuries. In 1913 in the state of Oregon similar legislation was passed. From this beginning the idea of prepayment medical services grew and before long many groups of employees organized themselves to finance medical services for all injuries and illnesses regardless of origin. Gradually other groups took over the idea of prepayment medical plans, and we find plans organized by fraternal organizations, unions, co-operative associations, employers and employees and many other groups of people with common interests. The latest entrants into the field of prepayment medical care have been medical societies. The earliest of these were the County Medical Societies in Washington and Oregon, who took over the plans already in operation under the various industrial organizations. The next and probably the largest prepayment medical plan was established by the Michigan State Medical Society (1939). In Canada one of the earliest plans was the Associated Medical Service Plan of Toronto—this plan being

*Dr. H. Schwartz has pointed out an historical error here. A type of prepayment medical care has operated in Cape Breton for many years—probably the oldest plan on the continent.

started in 1937. British Columbia early experimented with prepayment plans. Manitoba is the most recent sponsor of such a plan. Since these are Canadian plans and since they are sponsored by Medical Societies, they will be discussed in considerable detail in the body of this report.

Statistically the facts about prepayment plans are as follows: In United States and Canada there are many prepayment medical plans in operation. In general about four to five million people are covered by such plans, i.e. probably less than ten per cent of the whole population. Types of plans are distributed as follows: nearly 4 % of such plans are under industrial management; Medical Society plans account for a little more than 20% of the total; private group clinics for 15%; governmental plans for 7% and consumer sponsored plans for 5%. These plans are in operation all over the North American Continent. In 1943 more than 32,000 physicians were associated on a full or part time basis in these plans. The majority of these 25,000 were physicians who had agreed to serve under medical society plans. It is of interest that while medical society sponsored plans made up only 28% of the total, four fifths of the 25,000 physicians serving members of these prepayment organizations worked under medical society plans. The medical society contracts usually provide for paying participating physicians on a fee schedule basis, their fees being prorated according to available funds. There are nearly always some membership restrictions in these prepayment plans, generally having to do with an upper income level above which patients are no longer eligible for such plans. This upper income level may vary greatly, generally being between \$1,800.00 and \$2,000.00. For patients above that income level the physician may in addition charge patients the difference between the amount specified by the organization and his usual fee. Some plans also take in nursing service, dental service and hospital care, but these are generally left out of medical society plans. The type of service which is given by the medical society varies greatly. Many of them are purely surgical services, while others such as the Associated Medical Plan in Toronto gives a comprehensive coverage.

With this very brief background of statistical facts it is intended to examine several Canadian plans in detail as illustrations of what is being done by Medical Societies, and then to discuss what seemed to the Committee to be the pro's and con's of such a plan.

The first plan to be examined is the Associated Medical Service Plan in Toronto. The Associated Medical Service Plan in Toronto is one of the oldest plans on this Continent, starting in June, 1937, under the sponsorship of the Ontario Medical Association. It is a little difficult for the outsider to appreciate just how this relationship works as the Medical Association do not seem to have any very great share in the direction of the plan. However, they, at the beginning approved it and gave it their official blessing before it was launched. This plan in 1937 started with two loans of \$5,000.00 and since that time it has collected in premiums some \$3,000,000.00, and has expended over two million dollars on medical and hospital bills for subscribers and accumulated reserves amounting to 7% of earned income. The service which it gives is one of the most comprehensive on this Continent. It is listed as follows:

"Unlimited general physicians' care, specialists' attention, surgical and obstetrical care, hospitalization at \$300 a day for specified periods of time and

diagnostic procedures." Things which are not covered by the plan are "pre-existing conditions, preventive care, dental care, drugs and special nursing, ambulatory paediatric care up to two years, hospital nursery care for the new born, mental, alcoholic, venereal, tubercular and workmen's compensation cases." This medical service plan has the co-operation of about 1,700 physicians, i.e. about 90% of physicians in the area served. Present enrolment is about 32,000. The membership is predominantly urban, that is white collar, low and medium income level, 70% of its members being below \$2,000.00 and two-thirds being female. It is noteworthy that its growth was very rapid up until 1941, after that time there was a sharp decline largely because of a decrease in the number of applications but also partly because of disenrolment of old subscribers. About 50% of these disenrolments were accounted for by members in the services but nevertheless the people applying for this service has steadily gone down. Even without service losses the membership would still be below 50,000 or less than 5% of the population in the area served. The annual charges for a plan of this kind are \$24.00 for a single adult, \$45.00 for a couple, a couple with one child \$63.00, two children \$78.00 and each additional child under 17 years \$12.00, therefore the total cost for a family with three children is \$90.00. Looking at this plan from the angle of the medical men working under it a number of things have become clear. From personal contact with a number of Ontario physicians all of them seem to have a feeling that the plan has many good points but yet to have considerable resentment about working under this particular plan. It would seem that this is largely due to difficulties arising between the administrators of the plan and the physician working under it and perhaps could be gotten over by a more tactful sort of management. However, this plan seems to have an underlying defect in that the physicians engaged under it have little say as to the policies of the plan. Even though the plan carries the approval and is listed as a medical society plan, the full direction of the plan is almost entirely in the hands of the medical director and one or two colleagues, and it is extremely difficult for Ontario physicians to take part in its direction. Apparently the directors of the plan have the right to make drastic modifications in the rules whenever they see fit to do so, and in 1942 without any special consultation with members of the Medical Society, they decided they had to draw their purse strings in and in a rather arbitrary manner they cut out two things which alienated practically the whole groups of paediatricians in the province. Hospital nursery care for new born infants was stopped, as was all ambulatory care for infants under two. The paediatricians of the province have taken the attitude that these are extremely important public health services and it cannot help but lower the standards of medical practice if such conditions are allowed to exist. Also at the same time there was considerable discussion concerning managements' ability or right to cancel members who were considered to have used too much service. In 1943 there were 137 such cancellations. This resulted in considerable ill will toward the plan in the public mind and probably has something to do with the drop in membership. With regard to the doctor's attitude the matter was discussed thoroughly at the Toronto Academy of Medicine, the discussion being published in the *Bulletin* of that organization in April of 1941. At that time the general conclusion reached was that the majority of the profession working under this scheme were fairly well satisfied. However, paediatricians and ear nose and throat specialists were very much against this scheme and few of them would co-

operate in any way. The difficulties arose from the attitudes towards the care of infants already detailed. E.N.T. specialists complained that the plan refused to pay them for any consultations which had not been referred from a family physician. Their plea was that a good deal of their practice came to them direct and they should be paid specialist's fees for that just as they would if it had been referred from the family doctor. The Association was firm on these points and consequently paediatricians and E.N.T. people have pretty well broken away from the plan. With regard to specific complaints the Toronto Academy of Medicine had these things. First, that there were certain wealthy subscribers to the Association who demanded special attention for which the Association did not pay and for which the physician found it very difficult to collect from the subscriber. Secondly, that it was at times difficult to obtain the consent of the medical officers of the Association for special services which attending physicians felt were necessary for the patient. The Academy of Medicine expressed itself as feeling that the plan would work with certain modifications but as it was going at the present time there were difficulties which had to be overcome.

Turning now to a second medical plan, that in force in Manitoba, the following facts are noted. This prepayment plan is under the direct control of the Manitoba Medical Association and it was incorporated by an act of Parliament in 1942, for the purpose of supplying either surgical and obstetrical attention (Plan A) or a total medical service (Plan B). This service actually began to operate on September 1, 1944. In this plan there is a board made up of fourteen medical practitioners and seven laymen, with one physician as medical director. The service runs on a non-profit basis and uses the set up of the Manitoba Hospital Service Association for the enrolment of members, the collection of dues, and a disbursements of funds to the general practitioners. Only members of the Manitoba Hospital Association can enrol as members of this medical plan. At the present time the medical service plan pays a monthly fee of \$500.00 to the hospital association for acting as its agent in the duties aforementioned. This plan was wholly brought into being by the Manitoba Medical Association and its authors expressed their purpose as being anxious to demonstrate that medical coverage could be obtained at a satisfactory premium without government interference and regulation. The financial cost has been entirely borne by the Manitoba College of Physicians and Surgeons, the Manitoba Medical Association and the Winnipeg Medical Society. Most of the participating practitioners have signed a demand note for \$100.00 in favor of the Medical Service Plan to cover any contingency that may arise. The schedule of fees has been drawn up by the Manitoba Medical Association and in general has been favorably received by the practitioners of the province. However, it is stated categorically that for a number of years it will be impossible for the Manitoba Medical Service Plan to pay full fees according to schedule and it is accepted that practitioners will receive some 50 to 60 per cent of the schedule for any major work. Any one service of ten dollars or less will be paid in full but any service costing more will be prorated at the end of each month according to the amount of money available for distribution after operating expenses have been deducted.

The matter of specialists' service has been difficult in this plan. At the present moment a premium of 25% is allowed on the general practitioner's fee for a procedure carried out by a specialist. Since there is no recognized

group of specialists, any practitioner can designate himself a specialist in a field if he so desires and collects this premium. A practitioner may also name a second field in which he will practise, for example he may have a major specialty of orthopedics and a minor specialty of X-ray, but for the minor specialty he will receive only the fees paid to the general practitioner. This matter is still under negotiation and the whole situation seems to be very unsatisfactory. With regard to public demand for this service, from September of 1944 to February of 1945 the medical service plan had sold ten hundred and eighty contracts of Plan A—(i.e. surgical and obstetrical), and three thousand, three hundred and sixty of Plan B, i.e. is a total of four thousand, seven hundred and forty contracts, less than one per cent of the population of the province. It is fair to say that at the beginning the plan was restricted to Winnipeg and no great effort was made to sell the plan outside of Winnipeg. As usual tuberculosis and mental disease are excluded from coverage. No drugs, dental service or nursing service are included, and no fees are paid outside the province except in the case of an accident or an emergency condition. Any doctor who is a member of the Canadian Medical Association—Manitoba Division can practise under the plan, or if he is not a member of this Society by paying an annual fee of \$15.00 to the Association. The premiums paid are for a single person \$7.20 a year for Plan A, and \$21.00 a year for Plan B. For a married person including the whole family the fees are \$15.00 a year for Plan A, and \$42.00 a year for Plan B. The Board has adopted a rule that where the annual income of the individual is \$1,800.00 or more and the married individual is \$2,400.00 or more, the fee for any service may be arranged between practitioner and subscriber and the subscriber shall be expected to pay the balance of the fee. The report of the Manitoba Plan concludes as follows, discussing the probable success of the plan—"Time will tell and the medical profession in Manitoba, without any outside assistance, will stand the cost of obtaining the experience necessary to arrive at a proper adjustment of fee scale."

Plans in operation in British Columbia are the third to be briefly mentioned. Prepayment medical plans have been under way there since 1935. The first was an industrial plan sponsored by the Telephone Company in that province. The profession agreed to grant a discount of 25% off bills for procedures as listed in the fee schedule under this plan. This was during the depression years and it looked as if compulsory health insurance was coming very quickly in British Columbia. The profession felt that this was about the best they could do under these circumstances. This plan has continued to operate ever since and is fairly satisfactory and has remained solvent. Since that time a number of other plans have started all operating on the same two principles; (1) the free choice of a doctor and (2) bills to be paid according to an agreed percentage off the provincial fee schedule. About two years ago a plan was started in Victoria, B. C., approved by the Victoria Medical Association and by the Committee on Economics of the College of Physicians and Surgeons of B. C. The latter body felt that the contributions were rather low but because of the Medical Association's approval gave it their O. K. The scheme has become insolvent and folded up owing a considerable amount to the doctors of Victoria. Since then a number of other plans have been suggested but the Committee on Economics of the College of Physicians and Surgeons has felt that they were not practical because there never was a large enough group membership and that the solvency of the funds could scarcely

be maintained. Because of this the Medical Service Association was started and now includes 150 group employees with 18,000 members scattered through the province. This is a plan which works in close association with the Blue Cross Hospital Plan. This plan then serves about 2% of the 930,000 population of the province. There seems to have been continued demand in British Columbia for other types and there has been a whole mushrooming of private prepayment plans. Many of these the College of Physicians and Surgeons considered completely unsound and refused their approval. Financially many of them seemed rocky and there has been loss of money by a good many people including members of the profession as a result. The situation has become so confused there that at the present moment the government has appointed a Royal Commission to investigate the operation of all schemes giving medical and hospital benefits with the object of regulating them by statute. The Medical Society hope that eventually all plans will come under the regulation of the Insurance Act of the province with special supervision as to their operation. The conclusion reached by the British Columbia Society is that non-profit prepayment plans are a useful way of giving medical service. However, they strongly stress the dangers involved and feel that organized medicine should not contemplate going into such a plan unless it has sound legal advice and aid in drawing up the plan to be considered.

With these three plans as an example, the Committee would like to submit the following conclusions.

1. It would seem that public demand for prepayment medical service is not nearly as great as one would be led to believe that it is. In all the three provinces mentioned the percentage of the population served by the Plan is very small. Ontario is probably the fairest example; here the Associated Medical Services has had a good deal of good salesmanship, has offices in several cities and towns, and yet less than 5% of the population of the province is served by it and that percentage seems to be dropping to-day.

2. The income levels served by these plans seem to be pretty largely a group of people who are probably not getting satisfactory medical care to-day, but still they are a group of people that the large bulk of physicians' incomes come from. Looking at the income levels for Halifax families the following seems to be true: (the figures are these given us by Miss Wilson). Twenty-six per cent of Halifax families earn less than \$950.00. This indigent group are not able to pay physicians at the present moment and get free medical service. It would be completely impossible for them to subscribe to a plan which took in the neighbourhood of \$50.00 a year. Forty-seven per cent of Halifax families earn between \$950.00 per year and \$1,900.00. It is probable that the thrifty members of this group would be able to subscribe to such a plan but the members of the group who are not thrifty (probably the ones who do not pay their doctor's bills now) would certainly not be able to pay the necessary fees, therefore, the problem of giving care to this group would probably not be very much easier. Then a large number of these two groups making up 73% of Halifax population, would not be much helped by this plan. Seventeen per cent of Halifax families have an income between \$1,950.00 and \$2,950.00 and here the plan seemed to be widely and usefully used. This is the group which evidently cause trouble in Ontario because the practitioners feel that in general the plan fees are too low for them and they are not able to very successfully collect any higher fees. The final ten per cent, i.e. over

\$2,950.00 would probably not be covered by the plan at all. It would then seem that this plan might well give no improved medical service and greatly increase benefits to certain sections of Halifax's population, but that there still would be very large sections whose treatment would still be dependent on the beneficence of the doctors of the city. It would seem that if prepayment plans are to really cover the population, they must be on a compulsory basis so that the irresponsible members, who include a large proportion of medical cases, would of necessity have to take part in them for their own protection.

3. It has become apparent from some of the plans that they are still in the stage of experimentation, that there are no clear cut ideas as to fees to be charged or services to be rendered and, that in general, it is the medical profession who seem to be being asked to pay for experimentation along these lines.

4. From the opinions of doctors working under the plans it seems to be agreed that the plans are most successful if a medical director is in charge of them. There is however a tendency for the medical director to assume dictatorial powers and difficulties may then develop between the profession and himself. This certainly does not make for good practice in the province. Any plan which is considered, should have representation of the Medical Society on the Board, and it should be possible for the Medical Society to implement the things which they feel important.

5. The system of specialists under any of these plans is a very unsatisfactory one.

6. From a careful perusal of much of the writing on the subject it seems that the main motivation of these plans is not to provide better medical services, nor is it to ensure physicians of a fair income, but it is an attempt in nearly every case to do something to prevent the bringing in of government organized medical services. Whether or not this motivation is a worthy one and a useful one, is something which must be left to each individual, but there is some possibility that the business of going half way in such plans may result in poorer service and less satisfactory working conditions than either staying entirely away from the plan or from adopting some type of government plan.

From these considerations, then, it would be the Committee's feeling that the case for prepayment medical plans is poor and that a great deal of further study and further experience is necessary before they can be satisfactorily adopted.

ROBERT O. JONES
Chairman

Lockeport, N. S.
December 15, 1945

Dr. H. G. Grant
Halifax, N. S.
Dear Doctor:

Enclosed find a reprint from the *Medical Press and Circular*, London, of an article on "Penicillin," written by a former colleague of mine in Lockeport, viz. H. O. Blauvelt, F.R.C.S., now a surgeon of the North Middlesex Hospital, London.

I would like to have this reprint published in the BULLETIN of the Nova Scotia Medical Society.

As you will see by the enclosed letter the Editor of the *Medical Press and Circular*, has given his consent for this, under certain conditions. This article was written by a particular friend of mine, a Nova Scotian who has "made good" in the city of London, where he has lived for some time.

Yours truly
(Sgd.) T. C. Lockwood, M.D.

*The Value of Penicillin in the Treatment of War Injuries

HUGH BLAUVELT, F.R.C.S.

Surgeon, North Middlesex Hospital, London
formerly Lieutenant Canadian Army Medical Corps

FOR thousands of years the greatest problem in the treatment of war injuries has been the prevention and cure of infection. Hippocrates and Galen tried, the one by cauterising, the other by the application of miraculous medicaments, to cleanse war wounds and so prevent the symptoms now known to be due to infection. These methods failed, though the principle of cleansing wounds persisted for many hundreds of years. In the 16th century Botollo advised the removal of foreign bodies, bony fragments and bruised tissue, and in this way he anticipated the modern surgical treatment of wounds. Two hundred years later Desault recommended incision, excision and drainage for all wounds, and to this procedure he gave the name débridement. In 1929 Fleming discovered penicillin, and in the war of 1939-45, as soon as supplies were available, it was used in the treatment of all battle and civilian casualties.

Much clinical and experimental work remains to be done before the true value of penicillin is known. This article deals only with the practical aspects of penicillin therapy, and the methods and details of treatment which are described, have all been employed in the actual management of war-time injuries.

Requirements for Successful Therapy

The value of penicillin in war and other injuries is due to its power of inhibiting the growth of the staphylococcus and streptococcus. These organ-

isms, the cause of most wound infection, are sensitive to the weakest dilutions of penicillin, although at times strains are encountered which do not react in this manner. The clostridia welchii, oedematiens, and septique are sensitive in laboratory cultures, but are resistant in cases of gas gangrene. The pyocyanus and proteus, as well as all the Gram negative bacilli, are insensitive to the drug. When penicillin is to be employed, therefore, it is essential to obtain exact information regarding the bacteriological state of the wound, and also to carry out sensitivity tests upon the actual invading organisms.

Penicillin must come into direct contact with the organism for its action to be successful. This can be accomplished in many cases, as, for instance, in wounds, by applying the drug locally in the form of a powder or solution. When it is injected into a muscle penicillin is rapidly absorbed, and in a very short period of time it can be found in the urine and in most of the fluids of the body. The technical difficulties associated with intravenous therapy have led to the gradual abandonment of this method of administration.

Penicillin is destroyed by the acid gastric juice, so that the oral administration of the drug is of no use. Recent investigations, however, show that when given by mouth along with a buffer, such as sodium citrate, penicillin soon appears in the blood and urine. Cases of gonorrhoea have been successfully treated by giving penicillin orally in conjunction with sodium citrate.

Although penicillin can be recovered from the blood and urine soon after it is injected intramuscularly, only a negligible amount is present 4 hours later. To maintain the penicillin level by this method of systemic or parenteral administration the drug must be injected continuously or at frequent intervals. Continuous injections require almost constant attention, and in practice frequent discontinuous injections have proved to be more useful. Injections of 10,000 to 15,000 units are prescribed every three hours until a total of 500,000 units is reached.

Penicillin is held up by the endothelial membranes of the pleura, the peritoneum, the meninges, and the joints, and when these tissues and structures are infected systemic administrations are of no value. For these infections penicillin is administered directly as a solution, either by injection, as in suppurative arthritis, or by instillation, as in wounds of the lung.

Prophylactic Uses

Small wounds heal rapidly when treated simply by excision and suture. In the case of the larger and more complex wounds complete excision is impossible, and penicillin, though not always effective in preventing infection, does much to limit its extent and to lessen the likelihood of serious complications.

The experience of those who have treated large numbers of battle wounds suggests that the best results are obtained when penicillin is applied locally as a powder with sulphathiazole. Also, and in addition, the more severe wounds receive systemic penicillin by intramuscular injection.

Until a year or so ago it was the custom to leave open the larger and more extensive wounds and to rely on excision and plaster to prevent infection. This treatment was often successful, but many weeks elapsed before the cavity became filled with granulation tissue and received a covering with epithelium. Since the employment of penicillin in these cases it has been found that delayed primary suture can be practised with every chance that the wound will heal in one or two weeks' time.

Although skin and certain other soft tissues may be undercut so that approximation of the edges and tight suturing are possible, considerable disability may follow as a result of constrictions and contractures. For this type of wound an alternative, and often a better, form of treatment is to make good the epithelial loss with autogenous skin grafts.

Penicillin in Established Infections

The bacteriostatic power of penicillin is in no way lessened or diminished by the presence of pus. This quality makes the drug invaluable in the treatment of many of the suppurative complications of war injuries.

A common happening when an infected wound is treated with penicillin is the early disappearance of the staphylococcus and streptococcus and the appearance within a few days of the hardy and resistant pyocyanus and proteus. These organisms may be difficult to get rid of, and in addition they tend to delay the growth of epithelium at the edges of the wound. Not infrequently, after the pyocyanus and proteus have been destroyed, the staphylococcus and streptococcus reappear. There is little doubt but that the best way of preventing these infections is the early closure or covering of the wound by delayed primary suture or by skin grafting.

The signs of inflammation and the symptoms of toxæmia disappear rapidly when penicillin is employed for infected wounds. At the same time the patient experiences a feeling of well-being, often in marked contrast to his appearance and to his previous sensations.

The failure of penicillin to cure or to mitigate in any way the infection of gas gangrene as it occurred during the campaign in Italy is sufficient reason for the immediate employment of surgical measures for this virulent infection.

Common Injuries and Their Treatment

Wounds.

The prophylactic and curative treatment of wound infection have been described under other headings, and only one or two practical problems arising in connection with the treatment of small wounds will be referred to here.

The superficial portion of a wound may be small, but the deeper portion may be much more extensive. As the true nature of the wound can be ascertained only by exploration, the employment of penicillin should not be regarded as an excuse for neglecting to carry out the complete details of the operation of excision.

Particular care is needed in the management of wounds in certain situations and regions. Thus, a small wound in the perineum may at operation be found to have perforated the rectum, or even the pelvic peritoneum. Puncture wounds in the neighbourhood of joints frequently communicate with the synovial cavity. In these, and in many other apparently trivial wounds, a foreign body may be present and require to be removed. The existence of deep pockets and extensions should always be an indication for a complete course of systemic penicillin.

Compound Fractures.

Penicillin is used locally and systemically in the treatment of practically all compound fractures. Powdered penicillin is dusted into the wound at the time of its excision, and when large bones are involved rubber tubes are insert-

ed so that penicillin solution may be instilled at regular intervals—usually 1 c.c. of a solution containing 1,000 units every two hours. Systemic penicillin is also ordered in full doses. Plaster of Paris is conveniently employed for fractures of the limbs, and it helps to keep rubber tubes firmly in position.

Delayed primary suture of the wound should be performed when early primary suture is impracticable, and in this way secondary infection may be prevented.

Operations upon the fracture itself at the time of wound incision are being undertaken more frequently as the value of penicillin is becoming recognized. The following case may be mentioned as an illustration of this development in penicillin therapy. A compound comminuted fracture of the patella was treated by excision and suture of the wound. At the same time the quadriceps aponeurosis was stitched, three rubber tubes were inserted to the capsule, and plaster of Paris was applied. Penicillin solution was introduced into the tubes for four days, at the end of which time they became clogged; intramuscular injections were then given up to a total of 500,000 units. No infection was found when the plaster was removed, and the wound had entirely healed. X-rays showed signs of callus four weeks after the day of the accident.

Contradictory reports have been published in regard to the ultimate consolidation of fractures treated with penicillin, but there is general agreement that callus begins to form well within the normal time limits.

Perforating Wounds of Joints.

The case described above illustrates the prophylactic value of penicillin in joint as well as in bony injuries. It also illustrates the method of administering the drug when plaster of Paris is employed.

Suppurative arthritis is a serious condition which demands early or immediate treatment, but since the advent of penicillin severe and mutilating operations are required much less frequently. Purulent fluid is removed from the joint with a needle and a syringe, and 1,000 to 2,000 units of a solution of penicillin are injected. This procedure is repeated daily until the fluid is clear. Traction is exerted by strapping and weights when large joints of the limb are affected.

Immobilization with plaster of Paris is often preferable to skin traction, and as a rule no difficulty is experienced in connection with its application. The incorporation of rubber tubes in the wound and plaster also offers no practical difficulty, and provides easy means for the instillation of penicillin.

Chest Injuries.

Closed haemothorax is treated by aspiration of the blood and the injection of 5 c.c. of a solution containing 1,000 or more units of penicillin. This procedure is repeated every two or three days until no blood remains in the pleural cavity. When the blood within the thorax clots it is removed following the resection of a small portion of the rib.

Chest wounds not involving the lung or pleura are treated like wounds in other parts of the body. When the pleura is penetrated and a sucking pneumothorax results, the immediate closure of the wound is a matter of some urgency. This is generally a successful undertaking when carried out under cover of penicillin. For this purpose the drug is applied locally in powder form at the time the wound is excised and sutured, and afterwards a solution is injected into the intrapleural space. Wounds of the lung are best treated by instilling a solution of penicillin by means of rubber tubes.

Lung abscess and empyema are common complications of open chest injuries, and they are often associated with foreign bodies. Major thoracotomy operations may be required for deep-seated abscesses, and penicillin is given locally and systemically. Empyema is treated much like suppurative arthritis. Pus is removed from the cavity of the pleura by aspiration and 50,000 units of penicillin are injected or instilled immediately afterwards. Larger or smaller doses of penicillin are administered, depending upon the size of the pyothorax, and the treatment is repeated at 48-hour intervals for one or two weeks.

Head Injuries.

Scalp wounds are treated locally with penicillin like other superficial wounds, but when the meninges and brain are involved, additional methods of administration are necessary.

For wounds which penetrate the dura, 5,000 units of penicillin dissolved in 5 c.c. water are injected into the cerebro-spinal space every day. Wounds penetrating the brain should receive penicillin locally through tubes in the same way that wounds of the lung are treated. The drug may also be administered by injection into one of the lateral ventricles.

Foreign bodies are often present in penetrating wounds, and their removal should never be attempted without the aid of penicillin.

A complication greatly to be feared in wounds in the neighbourhood of, or involving, the eye is cavernous sinus thrombosis, and penicillin should be used both locally and systemically for these injuries.

Burns.

The prophylactic action of penicillin is not often made use of in the primary treatment of burns, but when infection is present, the drug is frequently employed, so that skin grafting operations may be undertaken at an early date. A practical objection to the local application of the drug after operation is the disturbance caused to the delicate grafts in their bed. For this reason systemic injections are indicated, though local injections are generally recommended up to the time of the operation.

Tactical Advantages of Penicillin

Certain operations and procedures, as, for example, the removal of foreign bodies and the manipulation of compound fractures, although usually attended by little or no risk, may be extremely dangerous when infection is present. A single dose of about 50,000 units of penicillin given before operation entirely alters the outlook in these cases, and seldom does any flare-up or spread of the infection occur. This tactical dose of penicillin may also be employed to dampen down other infections when operation is required.

In conclusion may be mentioned another less common but equally valuable use for penicillin. Sulphonilamides occasionally fail to control an infection which is ordinarily responsive. When this happens, it has been found that penicillin produces the opposite effect and destroys the organisms. One of the surgical conditions that may behave in this manner is infection of the nasal sinuses, and the exhibition of penicillin in these cases may prevent the occurrence of serious intracranial complications.

THE NOVA SCOTIA MEDICAL BULLETIN

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Abstracts From Current Literature

ANDROGEN CONTROL THERAPY IN CASES OF CARCINOMA OF PROSTATE. Herger, C. C. and Sauer, H. R.: Surg., Gun. and Obs., 1945, 90: 128.

Herger and Sauer employed castration singly or in combination with diethylstilbestrol medication in treating patients with demonstrable metastasis or with rapidly progressing lesions. Exclusive administration of diethylstilbestrol, usually in doses of 1 mg. daily, was reserved for patients with low grade malignant tumours with no demonstrable metastasis, in whom little progression was anticipated. Diethylstilbestrol alone was given to patients who refused or who were unsuitable for orchiectomy. Obstructive symptoms were treated by the usual methods, such as the indwelling catheter, suprapubic cystostomy or transurethral resection. Orchiectomy alone was carried out on 26 patients, 19 of whom had metastasis. In 48 other patients, 35 of whom had metastasis, castration was either preceded or followed by administration of diethylstilbestrol. The remaining 56 patients received exclusive diethylstilbestrol medication; metastasis was found in 11 of these cases. Analyzing the results obtained in their 130 cases, the authors say that favourable response was accomplished in numerous instances. Prolonged observation revealed that in a considerable number initial improvement developed into delayed failures. Even the most spectacular improvement has to be viewed with skepticism as to the ultimate outcome. Androgen control treatment has prolonged the lives of patients with far advanced or metastatic disease. The response to this treatment is much more impressive than the poor results accomplished by external or interstitial irradiation. Although improvement is of temporary duration, the simplicity of the method and the low surgical risk involved justify its use in combination with the usual methods in the treatment of high grade urinary obstruction. The results were most favourable in cases of metastatic lymph node involvement. Spread or local extension of bone metastasis is not arrested by androgen control treatment. Furthermore, this treatment does not protect the patient with nonmetastatic cancer of the prostate from developing metastasis at a future time. In spite of the apparent ineffectiveness of androgen control therapy on the bone metastasis, it cannot be denied that many of these patients derive temporary benefit, such as disappearance or improvement of pain, gain in weight and increase in well-being. Androgen control treatment, and particularly orchiectomy, should not be carried out indiscriminately in all cases of carcinoma of the prostate. Castration should be reserved for patients with metastatic disease, patients in whom metastasis is suspected or patients with rapid enlargement of the primary lesion.

BIOPSY AS AN ACCURATE GUIDE TO DECISION OF EARLY SKIN GRAFTING. Pritchard, J. E.: Ann. of Sur., 1945, 121: 164.

Pritchard says that in burns it is desirable to have some means of determining whether the wound can be expected to heal spontaneously or whether it should be skin grafted. At the Montreal General Hospital the treatment of burns includes the occlusive compression dressing with an emulsion of sulfa-

thiazole in an oil in water base. This dressing, except in superficial burns which heal within one week, is commonly removed on about the thirteenth or fourteenth day, with the intention of grafting if necessary. It is not easy, even at this stage, to be certain from the gross appearance of the wound whether it is healing satisfactorily or will require grafting. It was decided to submit all questionable cases at the time of removal of the first dressing to biopsy. Rapid frozen sections were relied on. If destruction involves most or all of the hair follicles but spares the sweat glands which lie at a deeper level, spontaneous reepidermization may still be expected, but the process will be slow. If the destruction extends deep enough to involve the sweat glands there will be no sources of reepidermization other than at the margins of the wound, and this, in all but small burned areas, is inadequate.

RETINAL CHANGES WITH DIABETES AND WITH HYPERTENSION.
BALLANTYNE A. J.: Arch. of Ophth., 1945, 33: 97.

Ballantyne maintains that the retinopathies of diabetes and the hypertensive diseases are separate entities. In both conditions the earliest lesions are changes in the retinal vessels. In diabetes these lesions affect primarily the venous, and in hypertension the arterial, side of the retinal circulation. In diabetes these changes point to venous stasis and, in addition to hemorrhages and exudates, consist in congestion of the veins, microaneurysms of the capillaries and gross changes in the principal veins. Microaneurysms seem to be the earliest pathologic change in the fundus of the diabetic patient. Histologically the earliest recognizable change takes the form of minute fatty granules in the vascular endothelium, together with swelling of the endothelial cells. In hypertension fatty granules are observed more frequently in the media and the adventitia. The most striking changes in the retinal veins of diabetic patients appear as expansions, beading and formation of loops, coils and networks, and the predominant microscopic changes at this stage are phlebosclerosis and intraretinal and preretinal networks of large thin walled vessels. The hemorrhages in diabetic retinopathy occur primarily in the central area of the fundus, are characteristically rounded and occur chiefly in the deep layers, for the most part the internuclear layer. In hypertension arterial changes predominate; the hemorrhages are primarily circumcapillary and striate, owing to their situation in the nerve fibre layer. Exudates are observed in the deep layers but also include patches of ganglion degeneration in the nerve fibre layer.

HERNIATED INTERVERTEBRAL DISK. Poppen J. L.: New Eng. Jour. of Med., 1945, 232: 211.

Poppen studied 400 surgically proved cases in which eighteen months to ten years have elapsed since surgical intervention. This series represents 8 per cent of the patients who entered the clinic with the complaint of low back pain. This emphasizes that even though the herniated disk is an important cause of low back pain and sciatica it is by no means the predominant one. The most constant objective finding was a positive straight leg reaction, which was present in 90 per cent of the patients when the protrusion was at the third, fourth or fifth lumbar segment. Seventy five per cent of the patients demonstrated spasm of the low back muscles. Localized paraspinous tender-

ness was present in 80 per cent. Forty-eight per cent had sensory changes in the fifth lumbar or first sacral dermatomes or both. Narrowing of the disk space was not an assurance that a posterior dislocation of a disk was present. A normal roentgenogram of the low spine in the presence of a typical history and findings is an additional indication of the probable presence of a ruptured cartilage. A patient who has had repeated disabling attacks of sciatica necessitating narcotics and who in the previous few months has been unable to work because of a ruptured cartilage should have an operation. When a patient has had mild recurrences of symptoms causing considerable discomfort but not severe enough to discontinue work, he should be treated conservatively with physical measures in the form of heat, massage and postural exercises, rest in bed on a firm mattress and administration of large doses of vitamin B intravenously for a few days. Patients with predominating leg pain and with minor back difficulty whose roentgenograms show no bone changes should have only the disk removed, whereas for a patient who has predominating back pain, with abnormal facets and evidence of an unstable back, and who has to do hard manual labor, removal of the degenerated cartilage with fusion is indicated. There were no deaths or paralysis in any of the patients operated on. Infection occurred in 3 patients, but opening the incision and allowing adequate drainage with liberal use of the sulfonamide drugs brought about wound healing. The shortest postoperative stay in the hospital was four days and the longest five weeks; the average stay was twelve days. The relief of sciatica was satisfactory in most of the cases. Residual back discomfort on heavy lifting or sitting in a cramped position for many hours occurred in almost half the patients. This percentage was not materially altered in those who also had fusions. Fifteen per cent of the patients did not obtain relief. Six cases in a series not treated surgically developed sudden complete paraplegia as a result of ruptured cartilage. Even though the protruded cartilages were removed in a relatively short time following the paralysis, many weeks and months elapsed before complete function returned.

USE OF DICUMAROL IN PREVENTION OF POSTOPERATIVE THROMBOSIS AND EMBOLISM. Barker, N. W., Cromer, H. E., Hurn, M. and Waugh, J. M.: Surg., 1945, 17: 207.

One thousand surgical patients were given dicumarol in the immediate post-operative period for the purpose of preventing postoperative venous thrombosis, pulmonary embolism and thrombophlebitis. Barker and his associates have found it effective in preventing these complications in cases in which there had been non-fatal pulmonary embolism, thrombophlebitis or a history of previous thrombosis or embolism and when the drug was given prophylactically if no thrombosis or embolism had occurred. There is a small risk of bleeding. This can be minimized by proper administration of the drug and rapid control of excessive prothrombin deficiency. Dicumarol should not be given unless prothrombin time tests are done daily. The prothrombin should be kept between 10 and 30 per cent of the normal. Excessive prothrombin deficiency produced by dicumarol can almost always be controlled by the intravenous administration of large doses (60 to 64 mg.) of menadione bisulfite (synthetic vitamin K). If bleeding occurs as the result of excessive prothrombin deficiency it can be controlled by transfusions of

freshly drawn citrated blood and intravenous administration of large doses of menadione bisulfite.

VENOPRESSOR MECHANISM IN PRODUCTION OF SHOCK. Gunther, L: U. S. Nav. Med. Bull., 1945, 44: 300.

According to Gunther peripheral circulatory failure is always associated with and preceded by a decline in intramuscular pressure. Shock, observed under these circumstances, is never manifest without a low intramuscular pressure. The value for intramuscular pressure may be found as low as 20 mm. of water. This level indicates a complete absence of muscle tonus and a complete failure of the venous pump. An increase in intramuscular pressure, either spontaneously or induced by treatment, to above 40 mm. of water always coincides with compensation of a failing peripheral circulation. Of the many substances studied, only two accomplished a restoration of a low intramuscular pressure. These were human plasma and a 25 per cent solution of pyridine-beta-carboxylic-acid-diethylamide, which is known as nikethamide. Human plasma reacts slowly, requiring from seventy to one hundred minutes to manifest its presser act on the venopressor mechanism. Nikethamide acts rapidly, manifesting its pressor action on the venopressor mechanism within five to ten minutes, but the effect does not last as long as with plasma. The intravenous administration of nikethamide in adequate dosage will support the venopressor mechanism during the time needed for plasma to become effective. Nikethamide is to be used as an adjunct before or concurrently with plasma. Nikethamide is relatively without toxicity. It must be given in large amounts intravenously to be effective. It is not effective for restoration of muscle tonus when administered by mouth or intramuscularly.

INTRASTERNAL INFUSIONS. Henning, N.: Deut. Med. Woch., 1945, 69: 720.

Intrasternal infusions represent a satisfactory substitute in cases in which the intravenous route is not available. The intramedullary route is suggested for cases in which the veins of the extremities are obliterated or are too small. Intrasternal infusions are of the greatest value in wartime for emergency blood transfusions in cases of severe injuries complicated by collapse or shock. Because the needle remains fixed in the cortical substance, the sternal infusion method is indicated in motor unrest of various origin, such as that of diabetic coma, acute circulatory collapse, malignant diphtheria and drug poisoning. The intramedullary route is particularly suited for infants and young children. Henning opposes Tocantins' opinion that the femur or the tibia should be used instead of the sternum in children under 3 years of age. By inserting the needle at an angle, intrasternal injections and infusions may be used in infants. The intramedullary injection into any bone is to be considered in case of failure of the intrasternal injection. The failure may be caused by clotting of the bone marrow and may be prevented by flushing the cannula with a 3.8 per cent sodium citrate solution prior to puncture.

E. DAVID SHERMAN, M.D.
Abstract Editor

Personal Interest Notes

DOCTOR and Mrs. D. F. Macdonald of Yarmouth were in New York during December where Doctor Macdonald attended a refresher course.

The marriage took place at Armdale, Halifax County on November 30th of Miss Helen Mae, daughter of Mr. and Mrs. Herman S. Harris, Bear River and Doctor Ira R. Sutherland of Annapolis Royal.

Doctor T. A. Kirkpatrick of Kentville gave a very interesting and instructive talk on November 12th on the mental and physical health of children at the monthly meeting of the Home and School Association at Hantsport.

Doctor J. A. Webster of Yarmouth is at present making a short visit to medical centres in Montreal, Toronto and New England, and on his return late in January will begin practice in Shelburne, coincidental with the opening of the new hospital, acquired from the navy. Doctor Webster is a son of the late Doctor C. A. Webster of Yarmouth, and is a great-grandson of Doctor T. O. Geddes, who one hundred years ago practised in Barrington. Doctor Webster graduated from Dalhousie Medical School in 1938 and has been a Squadron Leader in the R. C. A. F. He has practised at Christie Street Hospital, Toronto, and Camp Hill Hospital, Halifax. He spent three years as interne resident in Canadian and American hospitals before entering practice in Yarmouth with his father, and continued in Yarmouth for a short time after his father's death before joining the R. C. A. F.

Doctor C. D. Dobson, formerly of Yarmouth, who enlisted in the United States Marine Service in 1942, joining one of the American destroyers as a lieutenant has been promoted to the rank of Lieutenant Commander. Doctor Dobson saw service in the Mediterranean at Casablanca, Sicily, and Salerno. Later he transferred to transport duty and still later was made head of the medical services in Savannah, Georgia.

Major Clarence L. Gosse of Halifax has been admitted as a Fellow of the American College of Surgeons, the degree being awarded in absentia in December at the annual convention in Chicago. Major Gosse, a son of Doctor Norman H. Gosse of Halifax, recently returned from overseas where he had served for the past two and a half years with Canadian General Hospitals holding the post of surgical specialist. He graduated from Dalhousie Medical School in 1939, and then went to Cleveland, Ohio, where he remained for three years completing a residency in general surgery at St. Luke's Hospital, and later a fellowship in urology at the Crile Clinic.

Doctor Henry B. Ross of Halifax, who was recently discharged from the Royal Canadian Navy, has been appointed to the interne staff of Montreal Children's Hospital, where he will take post-graduate studies in paediatrics. Doctor Ross graduated from Dalhousie Medical School in 1937 and served

for three years in the R. C. N. V. R. in Newfoundland, Halifax and on ships at sea.

The marriage took place in Hamilton, Ontario, on December 29th of Miss Regis Palmer, elder daughter of Mr. and Mrs. Herbert J. Palmer of Hamilton and Doctor Wilfred John Dyer, second son of Mr. and Mrs. J. W. Dyer of Halifax.

Doctor R. B. Eaton of Amherst, who returned from overseas in November is at present in Toronto taking a post-graduate course. On his return he plans to settle in Sackville, N. B., and will be surgeon to the new hospital there. Mrs. Eaton, who also has a medical degree, carried out active practice in Amherst during the war years.

Doctor Evelyn F. H. Rogers, who graduated from the Dalhousie Medical School in 1927, has been selected as the first woman to be in complete charge of the units of the New York State Department of Health. This distinction comes with her official appointment as Acting Health Officer of the city of Utica, N.Y. Following graduation Doctor Rogers took further studies outside of Canada, and her last was the Public Health Course at Johns Hopkins at Baltimore. Since then she has been connected with the New York Department of Health.

Doctor Douglas C. P. Cantelope, who graduated from Dalhousie Medical School in 1942, was recently discharged from the R. C. A. F. and is now associated with Doctor H. A. Creighton and Doctor W. A. Hewat in Lunenburg. Before enlisting in the R. C. A. F. Doctor Cantelope was associated with Doctor R. M. Benvie at Stellarton. He was then stationed at the Eastern Air Command, Halifax, and at Sydney and was head of the medical service at Goose Bay, Labrador.

Doctor G. G. Simms of the Nova Scotia Department of Health addressed the Amherst municipal body at a meeting in December. He urged the Amherst town council to adopt a code of by-laws to ensure that all restaurant employees are free from infectious diseases, and stated that this action had already been taken by other towns in the province. The code of by-laws which he proposed does not apply to hotels.

Doctor O. Carvell MacIntosh will be in charge of the departments of radiology and pathology, at St. Martha's Hospital, Antigonish, the appointment to take effect in January, 1947. Doctor MacIntosh graduated from the Dalhousie Medical School in 1940, spent a year of general internship at the Saint John General Hospital, and then was appointed senior interne in the same institution and studied basic surgery and surgical pathology. In 1942 he received an appointment at the Dr. Frederick Banting Institute of Toronto and studied under the internationally known pathologist Doctor William Boyd. From the Banting Institute Doctor MacIntosh enlisted in the Royal Canadian Air Force and spent three and a half years on active service. During this time he maintained his interest in, and connection with laboratory work. He was discharged from the R. C. A. F. in December, 1945, and received an appoint-

ment in radiology in the Toronto Western Hospital and is at present pursuing his studies in that institution.

The Bulletin extends congratulations to Colonel B. F. Miller of Halifax who was honoured in the King's New Year honours list as a member of the Order of the British Empire.

Doctor Robert M. Caldwell, who enlisted in 1940, has returned to Yarmouth and resumed his profession as a medical practitioner.

The marriage took place in New Glasgow on November 17th of Miss Carolyn Graham, elder daughter of Mrs. and Mrs. Ralph C. Wall, and Doctor William Alexander MacQuarrie, son of Mr. and Mrs. G. H. MacQuarrie of Moncton. Doctor MacQuarrie has been practising in Trenton since his graduation from the Dalhousie Medical School in January, 1943.

Doctor J. P. McGrath of Kentville was the speaker for the evening at a meeting in November of the Pre-Medical Club of Acadia University, and gave an enlightening talk on the "Hygiene of the Nose and Throat."

The Bulletin extends congratulations to Doctor and Mrs. J. E. Donahoe at Halifax on the birth of a son, Robert Emmett, on December 22nd; to Doctor and Mrs. W. M. Roy, formerly of Halifax, now of Sacramento, California, on the birth of a son on December 30th; to Doctor and Mrs. G. Ritchie Douglas, New Glasgow, on the birth of a daughter on January 3rd and to Doctor and Mrs. Frank W. Morse, Lawrencetown, on the birth of a son, on January 3rd.

Doctor Clarence M. Bethune, is the new Superintendent, Victoria General Hospital. The appointment of Doctor Bethune, native of Baddeck, was announced the latter part of November at Province House. He succeeds Doctor George A. MacIntosh, who died last October. For many years a resident of Halifax and formerly on the staff of the hospital, Doctor Bethune returned to the city in September after four years overseas as a captain and major in the Royal Canadian Army Medical Corps. The new superintendent was born in Baddeck, where his father, Doctor John L. Bethune, was a practising physician. The Bethune family has produced more than a few doctors and the father was one of the Dalhousie University's first doctor graduates. Doctor Bethune graduated from the Dalhousie Medical School in 1931 and from then until 1936 was a resident physician at the Victoria General Hospital. After that and until the beginning of the war he carried on a private practice in anaesthesia while on the visiting staffs of the Victoria General, Halifax Infirmary and the Children's Hospital. He was a member of the Non-Permanent Active Militia in the Halifax Rifles, and donned the uniform as a captain when that unit was mobilized shortly before war was declared in 1939. In July, 1940, he joined the staff of No. 1 Canadian General Hospital and went to England in November, 1941. Doctor Bethune spent most of the next three years as registrar for the hospital in Britain. Many of the Dieppe raid casualties came to this hospital and for his work with these men Doctor Bethune received the M.B.E. in the King's New Year's honours list of 1944.

He was still with the hospital when it moved to France about a month after D-Day, the first Canadian hospital on the continent, and stayed with it through France, Germany and Belgium chiefly on administrative jobs. In March, 1945, he went to headquarters of the 21st Army Group as deputy assistant director of medical records for the Canadians.

Doctor Bethune has been a lecturer in anaesthesia on the staff of Dalhousie Medical School since 1933.

He is at present on a tour making inspections of leading hospitals in Boston, Richmond, Virginia; Chicago and Toronto, and conferring with leaders in hospital work. It is his aim to secure much helpful information in carrying out the furnishing and equipping of the Victoria General Hospital, now in course of construction, and he will gain first hand knowledge on the newest in equipment.

Doctor Bethune is centering his attention on the preparatory work in connection with the new hospital, while direction of the present hospital is being carried out by Doctor J. E. Hiltz, on leave from the staff of the Nova Scotia Sanatorium, Kentville.

Doctor J. E. Hiltz, who has been Acting Superintendent of the Victoria General Hospital for a year and a half, is now devoting a good part of his time to the organizing and staffing of the new hospital at Shelburne.

Thirty graduate nurses received their diplomas from the hands of Hon. F. R. Davis, M.D., Minister of Public Health, at the graduating exercises of the class of 1945 at the Victoria General School of Nursing on December 12th. The exercises were held in the recreation hall at the nurses' residence.

The following Nova Scotian doctors have recently returned from overseas: Doctor R. B. Eaton, Amherst; Doctor J. A. Langille, Pugwash, Doctors Clarence L. Gosse, W. E. Boothroyd, H. Ian MacGregor and Howard Goldberg, all of Halifax, and Doctor J. D. McFetridge of Middle Musquodoboit.

Golf Course Has 18 Holes but Writer Finds 17 Are Unnecessary*

What is golf?

Golf is a form of work made expensive enough for a man to enjoy it. It is physical and mental exertion made attractive by the fact that you have to dress for it in a \$200,000 clubhouse.

Golf is what letter-carrying, ditch digging, and carpet-beating would be if those three tasks had to be performed on the same hot afternoon in baggy pants and colored socks by a gouty-looking gentlemen who required a different implement for every mood.

Golf is the simplest looking game in the world when you decide to take it up, and the toughest looking after you have been at it ten or twelve years.

It is probably the only known game a man can play as long as a quarter of a century and then discover that it was too deep for him in the first place.

The game is played on carefully selected grass with little white balls and as many clubs as the player can afford. These little balls cost from seventy-five cents to \$25, and it is possible to support a family of ten people (all adults)

for five months on the money represented by the balls lost by some golfers in a single afternoon.

A golf course has eighteen holes, seventeen of which are unnecessary and put in to make the game harder. A "Hole" is a tin cup in the centre of a "green." A "green" is a small parcel of grass costing about \$1.98 a blade and usually located between a brook and a couple of apple trees, or a lot of "unfinished excavation."

The ball must not be thrown, pushed or carried. It must be propelled by about \$200 worth of curious looking implements, especially designed to provoke the owner.

Each implement has a specific purpose and ultimately some golfers get to know what that purpose is. They are the exceptions.

After each hole has been completed the golfer counts his strokes. Then he subtracts six and says, "made that in five. That's one above par. Shall we play for fifty cents on the next hole, too, Ed.?"

After the final or eighteenth hole, the golfer adds up his score and stops when he has reached eighty-seven. He then has a swim, a pint of gin, sings "Sweet Adeline" with six or eight other liars and calls it the end of a perfect day.—*Canadian Purchaser Magazine*. (Reprinted from *Yarmouth Herald-Telegram*, December, 1945).

Obituary

THE death occurred recently at the Royal Victoria Hospital, Montreal after a lengthy illness of Doctor Edward William Archibald, at the age of seventy-three, whose skill as a surgeon brought fame to Canada and many honours to himself during over half a century of medical work. Born August 5, 1872, he was the son of the Hon. Justice John S. Archibald, native of Musquodoboit, and former Acting Chief Justice of the Superior Court in Montreal and Ellen Hutchison Archibald. He graduated from McGill University, receiving his B.A. degree in 1892, and his M.D. four years later. He did post-graduate work at universities in France, Germany and England.

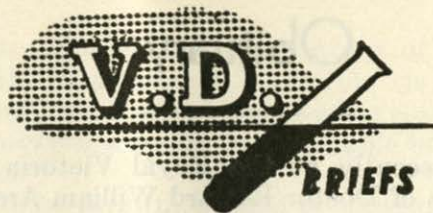
Doctor Archibald rose to become chief surgeon at the Royal Victoria Hospital, chairman of the department of Surgery at his Alma Mater, and the recipient of honours from England, France and the United States for his outstanding work.

Among these was the award of the Trudeau Medal from the National Tuberculosis Association for pioneer work in chest surgery—the introduction of thoracoplasty in 1912; he was made an honorary member of the Royal College of Surgeons in London, 1927, the first Canadian to receive an honorary membership in the New York Academy of Medicine; Honorary member of the Royal Academy of Medicine of Rome; was granted the honorary degree of Doctor of Medicine of the University of Paris in 1938; received the Lister Fellowship and in 1940 was honoured by McGill University with the Degree of Doctor of Science, *honoris causa*. The first world war found Doctor Archibald in casualty clearing stations in the forward areas; the second world war saw him nearly thirty years older once again in uniform overseas. He was the first consulting surgeon in the directorate of Medical Services, Ottawa, and started on a book "War Wounds". Then he flew to London and finally to Europe and was in the front line at Nijmegen with the Canadian troops. In November 1944, he was invalided back to England, going into the Royal Victoria Hospital, Montreal, remaining there until his death.

Doctor Archibald was a member of many international surgical societies, and was the President of the American Association for Thoracic Surgery. In 1935 he went to Melbourne, Australia, where he received honorary fellowship in the Royal College of Surgeons at Australia. Doctor Archibald travelled all over the world to perform surgical work, and was the author of many publications.

Surviving are his wife, the former Agnes Wood Black Barron of LaChute; four daughters, three brothers and one sister.

The BULLETIN extends sympathy to Doctor M. E. McGarry of Margaree Forks on the death of his wife which occurred on January tenth; and to Colonel B. F. Miller of Halifax, on the death of his brother, Reverend Cyril E. Miller, pastor of Lourdes parish, Stellarton, which occurred on November 24th.



Prevention of Spread of V.D. to the Civilian Population by Veterans of World War II

The following measures have been taken by the Canadian Armed Forces to prevent the spread of venereal diseases to the civilian population of Canada by Armed Forces personnel who are being retired or discharged from the Services.

1. Case Finding of Syphilis.

A serologic test for syphilis is done on all personnel of the Navy, Army and Air Force at the time of retirement or discharge. To ensure further follow-up, the names of all personnel with a positive or doubtful serologic test for syphilis are then submitted to the Division of Venereal Disease Control of the Health Department of the province where the former member of the forces intends to reside.

2. Prevention of Spread of Venereal Infection.

Personnel of the Navy, Army and Air Force who are found to have venereal disease in a communicable form at the time of their medical examination prior to retirement or discharge, are retained in the Service until they have received such treatment as may be necessary to render their infection non-communicable.

3. Re-Assessment of Every Syphilis Infection.

All personnel of the Navy, Army and Air Force with a history of syphilis infection, contracted either prior to or during their service, are given a complete medical examination for re-assessment of their syphilis infection. A summary of their case is then submitted to the Division of V.D. Control of the Health Department of the province where such personnel intend to reside. This summary of their case can, therefore, be made available by the Provincial Health Department to any physician who may be consulted by a former member of the Armed Forces for further medical care, observation and/or follow-up of a syphilis infection for which medical care was given in the Armed Forces.

V. D. BRIEFS

CASES OF VENEREAL DISEASE INFECTION REPORTED BY PROVINCIAL HEALTH DEPARTMENTS TO THE DOMINION BUREAU OF STATISTICS, 1944

	GONORRHOEA	- SYPHILIS	Ratio Gonorrhoea/Syphilis
Prince Edward Island.....	20	35	0.6
Nova Scotia.....	1,663	496	3.3
New Brunswick.....	913	573	1.6
Quebec.....	3,936	6,539	0.6
Ontario.....	7,317	5,225	1.4
Manitoba.....	1,737	663	2.6
Saskatchewan.....	1,123	360	3.1
Alberta.....	1,348	750	1.8
British Columbia.....	2,976	1,270	2.3
CANADA.....	21,033	15,911	1.3

In 1944, 21,033 cases of gonorrhoea and 15,911 cases of syphilis were reported by provincial health departments to the Dominion Bureau of Statistics. The ratio of gonorrhoea to total syphilis was, therefore, 1.3 to 1.

The experience of the three Armed Forces in Canada from 1940 to 1944 reveals that the ratio of gonorrhoea to total syphilis in Canada for that period was approximately 6 to 1. It is apparent, therefore, that the reporting of gonorrhoea by physicians in Canada is very inadequate. There is reason to suspect that syphilis is not being reported completely.

We know definitely that 15,911 cases of syphilis came to attention. Admitting that the ratio of gonorrhoea to syphilis was 6 to 1, it is estimated that in 1944 there were at least 90,000 cases of gonorrhoea in Canada. Of these, only 21,033 were reported by physicians.

The incidence rate of syphilis in Canada is exceedingly high. In 1944 the syphilis rate for Canada was 135 per 100,000 per annum. In 1942, the syphilis rate for Sweden was 7 per 100,000 per annum, the rate for Denmark was 23 per 100,000 per annum and the rate for Norway was 38 per 100,000 per annum. These are three countries which have maintained reliable venereal disease statistics over a period of years.

*The 1945 Canada Year Book

The 1945 edition of the *Canada Year Book* is now available. The extraordinarily wide scope of this *Year Book* is fully recognized. It is a unique source for authoritative information on the various aspects of Canada, both geographical, commercial and sociological. Fresh material appears, such, for instance, this year, as special articles on the Canadian Eastern Arctic; Canadian Oil Production; Changes in Manufacturing from Peace to War; Northern Airfields; Activities of the War-time Prices and Trade Board; Democratic Functioning of the Press, etc. Other articles which have already appeared, and have continuing value will be reprinted, or can be obtained on request.

By special concession a limited number of paper bound copies have been set aside for ministers of religion, students and teachers, at \$1.00 each. Bound copies are supplied at \$2.00 each. Applications for these should be made to the Dominion Statistician, Dominion Bureau of Statistics, Ottawa.

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